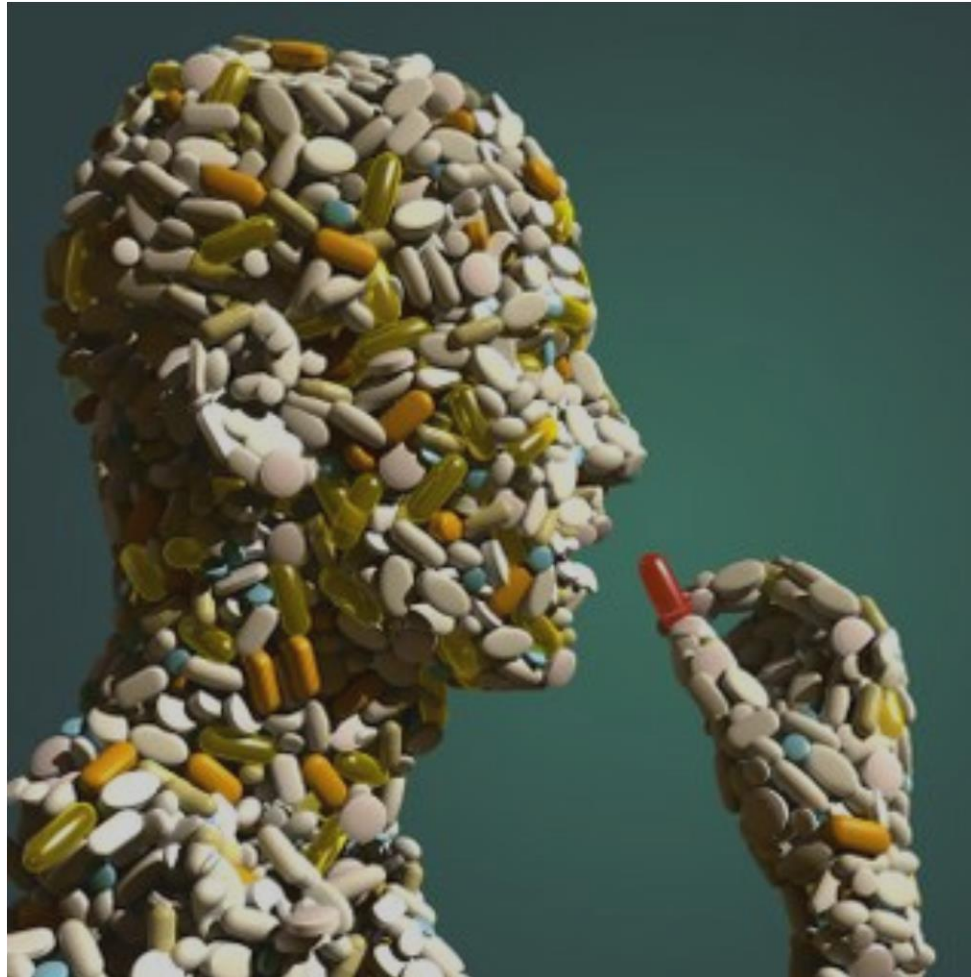


# Alcohol and Drug Use



# Drug Use

- ◆ A drug is any substance with the potential to alter the structure and function of a living organism
- ◆ People use drugs for many reasons, including medicinal, recreational, religious or spiritual reasons; to produce altered states and special sensations; and due to rebellion and alienation, peer pressure, and curiosity



# Drug Classification



- ◆ Drugs can be classified according to the Controlled Substance Act of 1970 (Schedules I–V)
- ◆ Drugs are frequently classified according to their physiological effects
- ◆ Stimulants such as cocaine, caffeine, and nicotine speed up the nervous system
- ◆ Depressants such as alcohol, sedatives and tranquilizers slow down the central nervous system

- ◆ Schedule I: High abuse potential, with no accepted medical use: heroin, LSD. These drugs cannot be prescribed and their use is illegal.
- ◆ Schedule II: Drugs with high abuse potential, but medical uses as well: opiates, barbiturates, amphetamines, cocaine. These drugs can only be obtained with a narcotic prescription written by a physician.
- ◆ Schedule III: Low to moderate abuse potential, with many medical uses: some tranquilizers and sedatives. These drugs require a regular prescription, written by a physician.
- ◆ Schedule IV: Low abuse potential, many medical uses: codeine, Valium, some other widely-used tranquilizers, as well as a vast number of other drugs. These also require a regular prescription by a physician or nurse practitioner.
- ◆ Schedule V: Drugs with minimal abuse potential. These are over-the-counter drugs: NSAIDS, antacids, laxatives, etc.

# Drug Classification

- ◆ Psychoactives such as LSD and PCP can alter feelings, moods, or perceptions
- ◆ Narcotics are powerful painkillers that also produce pleasurable feelings and induce sleep
- ◆ Inhalants are volatile nondrugs that cause druglike effects if inhaled
- ◆ Designer drugs are analogs of drugs that are manufactured in illegal laboratories



# Caffeine

- ◆ Caffeine is a stimulant
- ◆ Caffeine is probably the most commonly used drug in the U.S.
- ◆ Most adults can safely consume relatively low doses of caffeine (equal to 2 to 3 cups of coffee per day)
- ◆ Caffeinism is experienced by approximately 10% of adults





BUS  
STOP

WHO IS YOUR  
HEALTH-CARE  
PROVIDER?

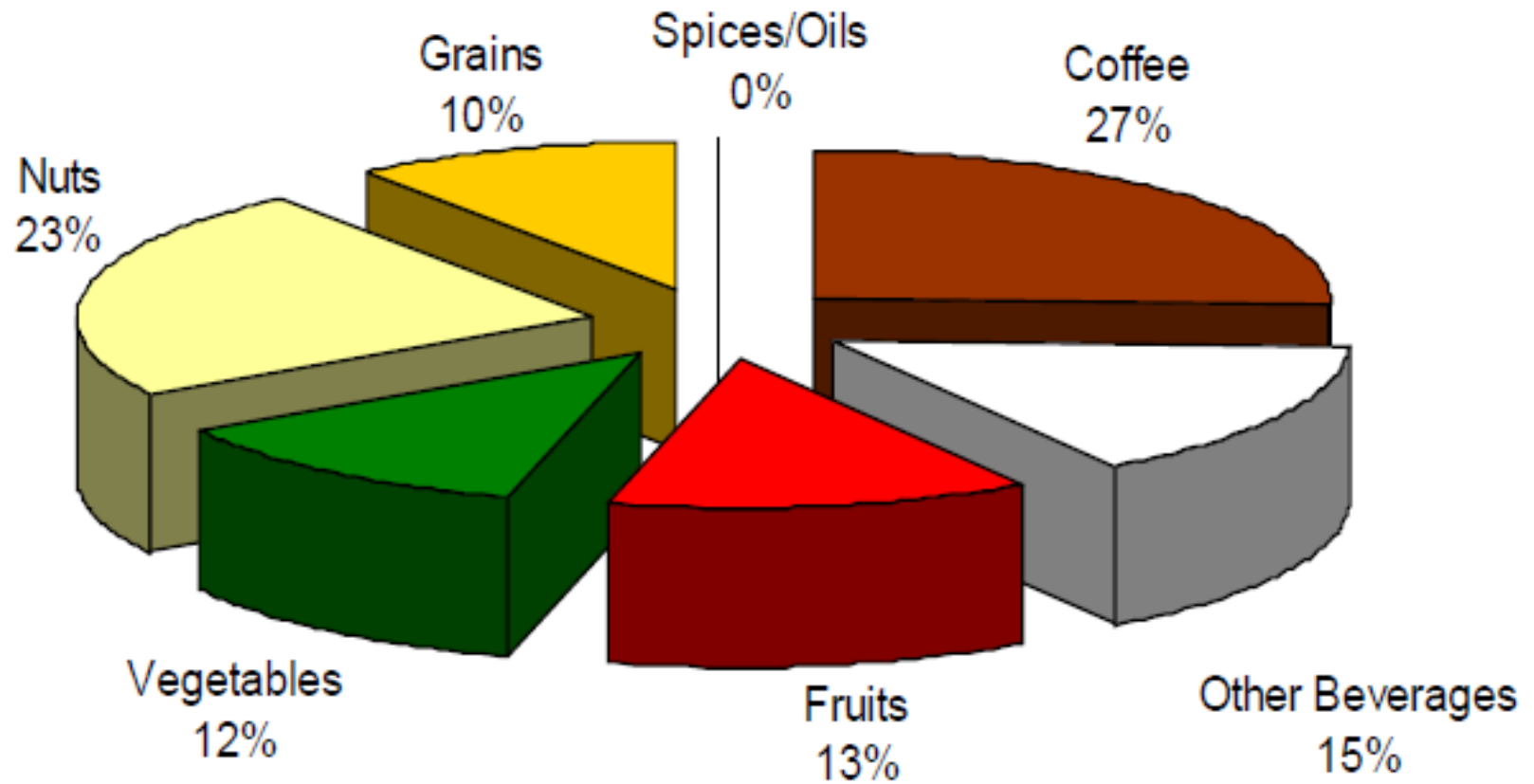
STARBUCKS.

COFFEE IS  
TOP SOURCE  
FOR ANTI-  
OXIDANTS

NEWS

ROGER  
©2005 PITTSBURGH  
POST-GAZETTE

# Antioxidants in the American Diet





# Alcohol

- ◆ Alcohol is a sedative and central nervous system depressant
- ◆ Alcohol probably causes more physical, social, and emotional damage than any other drug
- ◆ Ethyl alcohol is the intoxicating agent in all alcoholic drinks
- ◆ The percentage of alcohol in a beverage is measured by proof: a drink that is 40% alcohol is 80 proof



# Alcohol

- ◆ Blood alcohol concentration (BAC) is the percentage of alcohol in the blood
- ◆ BAC is affected by the amount and rate of consumption, the type of alcohol, the body weight of the person drinking, and the drinker's alcohol tolerance
- ◆ In most states, the legal limit for driving is 0.08
- ◆ A 150 pound person can metabolize about one drink per hour



# Alcoholism

- ◆ Alcoholism is a disease in which a person loses control over drinking
- ◆ Alcoholism crosses all social, economic, gender, educational, and racial lines; there is no single reason why a person becomes an alcoholic
- ◆ Alcoholism appears to have a strong genetic component: It is 4–5 times more common in biological children of alcoholic parents than in those of nonalcoholic parents

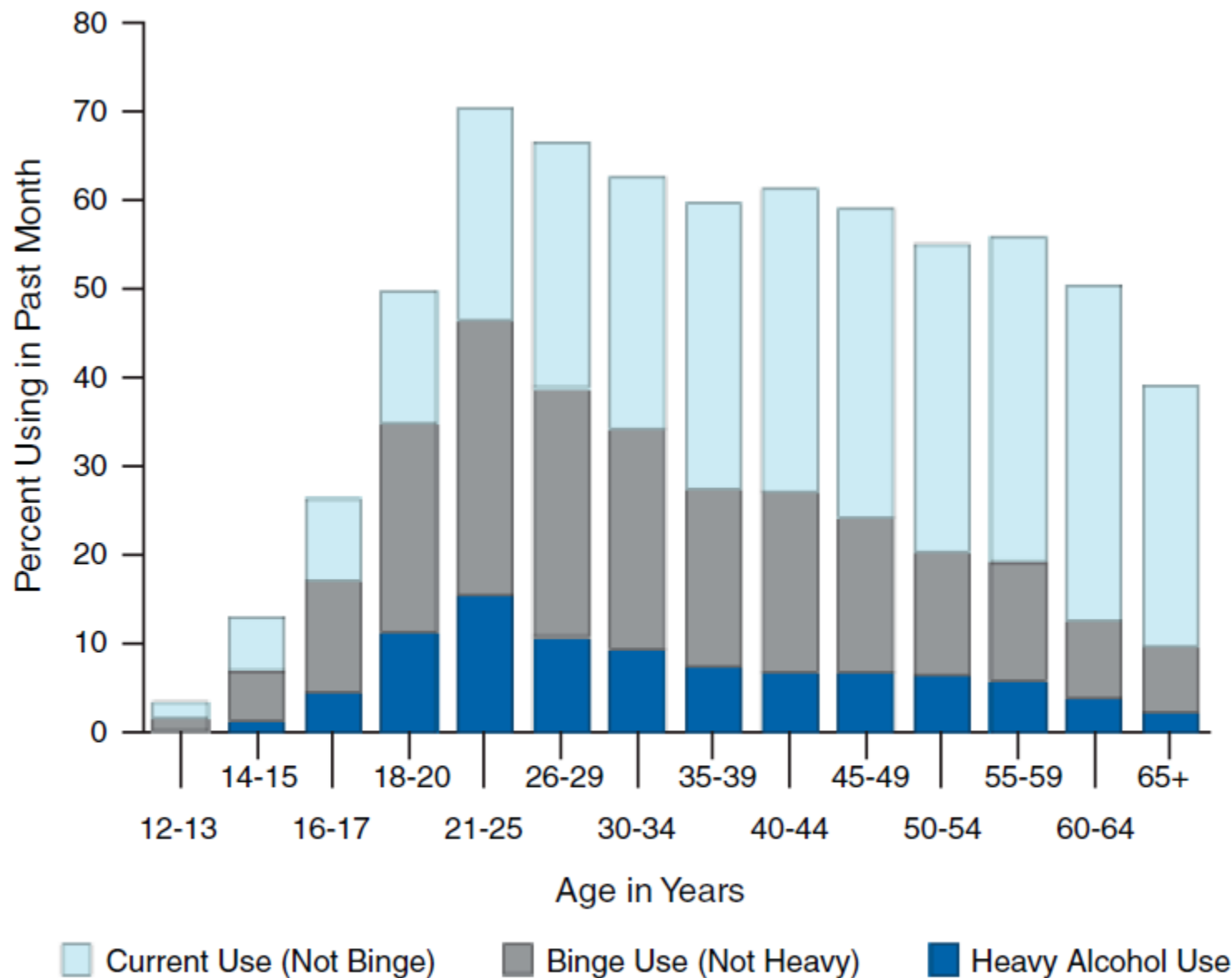


# Consumption Guidelines

- ◆ The Dietary Guidelines for Americans says:

*“If alcohol is consumed, it should be consumed in moderation.”*

- ◆ Moderation is defined as:
  - Men: No more than 2 drinks per day
  - Women: No more than 1 drink per day
- ◆ Binge drinking:
  - Men: 5 or more drinks in one session
  - Women: 4 or more drinks in one session



Current, binge, and heavy alcohol use among persons 12 or older by age, 2009.

One mixed drink with

- 1.5 fl oz (44 mL) of 80-proof liquor (such as vodka, gin, scotch, bourbon, brandy, or rum)



5 fl oz (148 mL)  
of wine



12 fl oz (355 mL) of  
beer or wine cooler



© Healthwise, Incorporated

Alcohol is alcohol. It does not matter if it is beer, wine, or a mixed drink. It's the quantity that counts.



# Absorption and Metabolism of Alcohol

- ◆ The presence of food in the stomach slows absorption
- ◆ Women will absorb 30% more alcohol into the bloodstream
- ◆ Women are more susceptible to alcoholic liver disease, heart muscle damage and brain damage
- ◆ Alcohol can change estrogen levels, increasing breast cancer risk
- ◆ Native Americans have higher rates of liver damage due to alcohol consumption

# Alcohol and Its Effects

- ◆ Alcohol is distributed quickly and thoroughly in the body
- ◆ Alcohol is an anesthetic because it puts brain centers to sleep
- ◆ It affects the central nervous system and can slow reactions even in small concentrations



# Alcohol and Tolerance

- ◆ With continued exposure, the body becomes more efficient in removing high levels of alcohol from the blood
- ◆ Regular drinkers may increase their consumption because the alcohol is now less effective in producing the desired effect
- ◆ Increased consumption may lead to addiction
- ◆ Alcohol addiction is sometimes treated with the drug Antabuse



# Alcohol Abuse

- ◆ Sometimes referred to as a problem drinker, this person may experience psychological, social, family, employment, or school problems because of alcohol
- ◆ Problem drinkers often binge drink and turn to alcohol when faced with problems or needing to make decisions
- ◆ Binge drinking contributes to violence, assault, and date rape



# Alcoholism

- ◆ A dependency on alcohol characterized by:
  - craving (a strong need to drink)
  - loss of control (being unable to stop drinking despite a desire to do so)
  - physical dependence and withdrawal symptoms
  - tolerance (increased difficulty of becoming drunk)
- ◆ Uncontrollable drinking causes negative effects on physical health, family relationships, and social health

# Impact of Alcohol on Nutrition

- ◆ If you are in good health and otherwise well nourished, the occasional consumption of alcohol will probably have little effect on your nutritional status
- ◆ Alcohol is not a nutrient and is not stored in the body
- ◆ Alcohol supplies 7 calories/gram of energy
- ◆ Alcohol and mixers contribute additional calories which may cause unwanted weight gain
- ◆ Substituting alcohol for food results in a poor dietary choices and malnutrition



# Health Benefits of Alcohol

- ◆ Like any drug, there is a safe dose and a level that will cause harm
- ◆ Most research indicates wine consumption to be most beneficial
- ◆ The protective effect is the result of increased levels of HDL cholesterol
- ◆ Alcohol also inhibits blood from forming clots, thus reducing the risk of death from heart attack



# Health Risks of Alcohol

- ◆ Alcoholic hepatitis is inflammation and injury to the liver due to excess alcohol consumption
- ◆ Cirrhosis (scarring of the liver) is a chronic, degenerative disease of the liver in which the liver cells become infiltrated with fibrous tissues
- ◆ Chronic alcohol abuse is the most common cause of cirrhosis



# Ethanol

Red - generally "bad"  
Green - generally "good"

## Large consumption

### **Brain:**

- Impaired development

- Wernicke-Korsakoff syndrome

- \* Vision changes

- \* Ataxia

- \* Impaired memory

- Psychological

- \* Cravings

- \* Irritability

- \* Antisociality

- \* Depression

- \* Anxiety

- \* Panic

- \* Psychosis

- \* Hallucinations

- \* Delusions

- \* Sleep disorders

### **Mouth, trachea and esophagus:**

- Cancer

### **Blood:**

- Anemia

### **Heart:**

- Alcoholic cardiomyopathy

### **Liver:**

- Cirrhosis

- Hepatitis

### **Stomach:**

- Chronic gastritis

### **Pancreas:**

- Pancreatitis

### **Peripheral tissues:**

- Increased risk of diabetes type 2

## Small to moderate consumption

### **Systemic:**

- Increases insulin sensitivity
- Lower risk of diabetes

### **Brain:**

- Reduce the number of silent infarcts

### **Blood:**

- Increases HDL
- Decreases thrombosis
- Reduces fibrinogen
- Increases fibrinolysis
- Reduces artery spasm from stress
- Increases coronary blood flow

### **Skeletal:**

- Higher bone mineral density

## Effects linked with both small and large consumption

### **Joints:**

- Reduced risk of rheumatoid arthritis

### **Gallbladder:**

- Reduced the risk of developing gallstones

### **Kidney:**

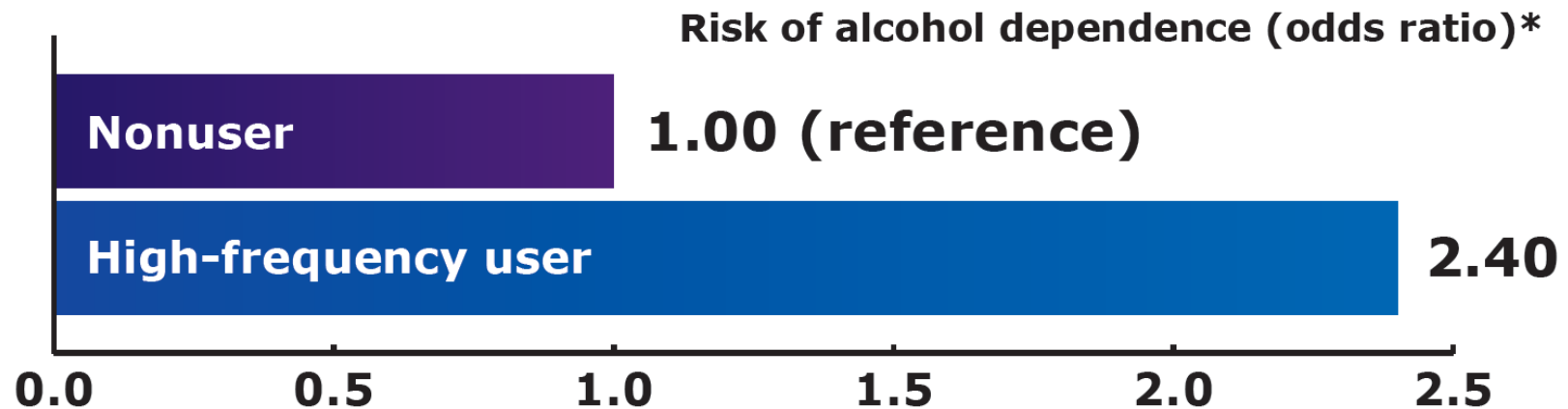
- Reduced risk of developing kidney stones

# People Who Should Not Drink Alcohol

- ◆ Children and adolescents
- ◆ Women who are pregnant or may become pregnant
- ◆ Individuals who plan to drive, operate machinery, or take part in other activities that require attention, skill, or coordination
- ◆ Individuals taking prescription or OTC medications that can interact with alcohol
- ◆ Individuals of any age who cannot restrict their drinking to moderate levels



# Energy Drinks Lead to Alcohol Dependence?



\*Assessed according to DSM-IV criteria.

**Conclusions:** Weekly or daily energy drink consumption is strongly associated with alcohol dependence. College students who frequently consume energy drinks represent an important target population for alcohol prevention.

# The CAGE Questionnaire

- C – Have you ever felt the need to Cut down on your drinking?
- A – Have you ever felt Annoyed by criticism of your drinking?
- G – Have you ever felt Guilty about your drinking?
- E – Have you ever felt the need for a morning Eye-opener drink?







- ◆ AA is a mutual aid society started in 1935 by Bill Wilson and Dr. Bob Smith
- ◆ Many of the 12 steps relate to the religious principles of Honesty, Forgiveness, and Unselfishness
- ◆ While the program is not without its detractors, the Alcoholics Anonymous support group has helped many alcoholics stay sober



Bill W.



Dr. Bob S.

# The 12 Steps

1. We admitted we were powerless over alcohol, that our lives had become unmanageable.
2. Came to believe that a power greater than ourselves could restore us to sanity.
3. Made a decision to turn our will and our lives over to the care of God as we understood Him.
4. Made a searching and fearless moral inventory of ourselves.
5. Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
6. Were entirely ready to have God remove all these defects of character.
7. Humbly asked Him to remove our shortcomings.

# The 12 Steps

8. Made a list of all persons we had harmed, and became willing to make amends to them all.
9. Made direct amends to such people wherever possible, except when to do so would injure them or others.
10. Continued to take personal inventory and when we were wrong promptly admitted it.
11. Sought through prayer and meditation to improve our conscious contact with God as we understood Him, praying only for knowledge of His will for us and the power to carry that out.
12. Having had a spiritual awakening as the result of these steps, we tried to carry this message to alcoholics, and to practice these principles in all our affairs.

# The Serenity Prayer

God, grant me the  
serenity to accept the  
things I cannot change;

The courage to change  
the things that I can;

And the wisdom to  
know the difference.



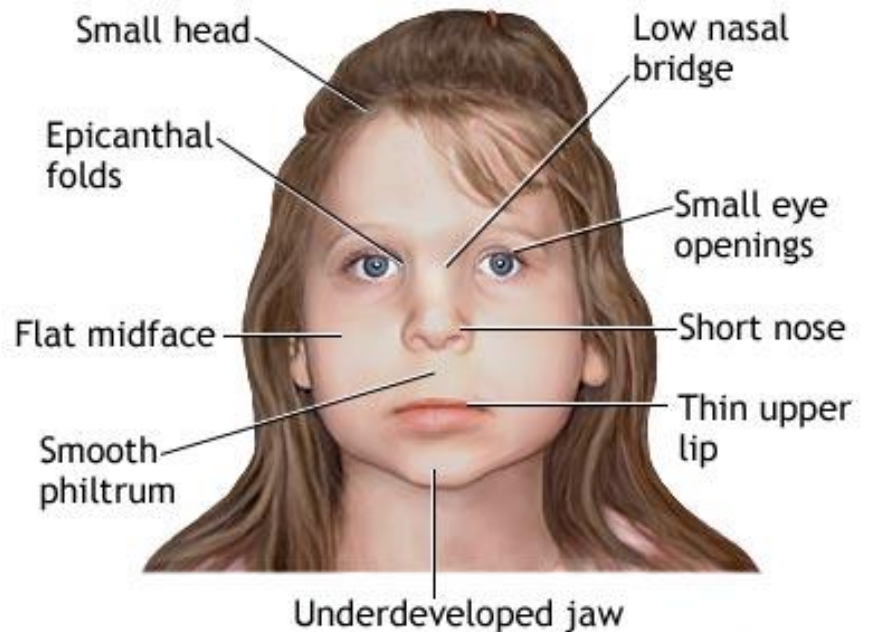
# Fetal Alcohol Syndrome (FAS)

- ◆ A pattern of birth defects found in the children of mothers who drank alcohol during pregnancy
- ◆ FAS is the most common source of preventable birth defect
- ◆ Women who are trying to conceive should not drink alcohol
- ◆ Women who are pregnant should stop drinking immediately



# Four Criteria of FAS

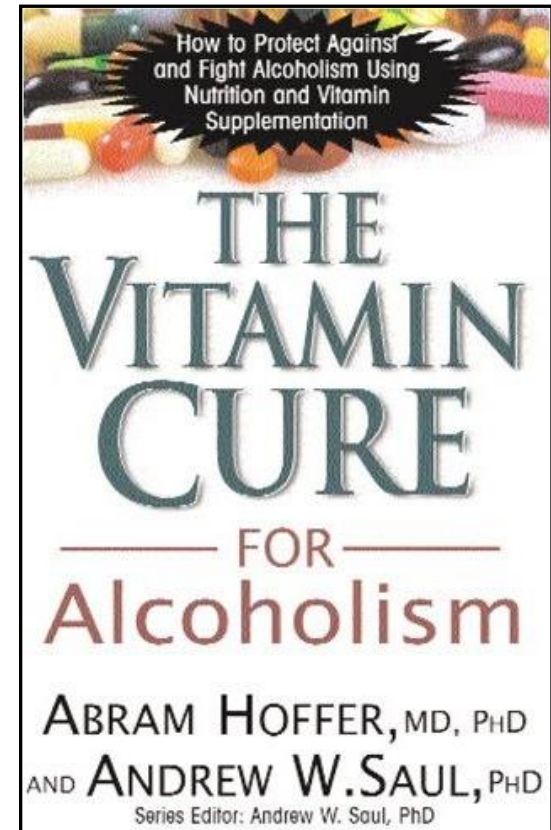
- ◆ Maternal drinking during pregnancy
- ◆ Characteristic pattern of facial abnormalities
- ◆ Growth retardation
- ◆ Brain damage including intellectual difficulties or behavioral problems





# Nutritional Rx for Alcoholics

- ◆ Obviously the best solution is for the alcoholic to quit drinking.
- ◆ However, if you have patients or family members who will not quit, you can help prevent the liver damage and other adverse effects of alcohol with nutrition, such as more B vitamins and milk thistle herb.



# Cocaine

- ◆ Cocaine is a powerful stimulant
- ◆ The most common methods of use are snorting, injecting, and freebasing
- ◆ The cocaine high in any form usually lasts no longer than 30 minutes
- ◆ Cocaine addiction is extremely difficult to overcome

## Crack Cocaine Effects

Increased heart rate, muscle spasms and convulsions can be experienced...



# Marijuana

- ◆ Marijuana found on the streets today is much more powerful than 25 years ago
- ◆ Of the 400 known chemicals in marijuana, more than 60 are cannabinoids
- ◆ THC (delta-9-tetrahydrocannabinol) appears to be the chemical responsible for the effects of marijuana
- ◆ Marijuana appears to be more carcinogenic than tobacco



# Other Drugs of Concern

- ◆ Heroin is a narcotic synthesized from morphine
  - Heroin use has increased significantly, especially among well-educated people
- ◆ Methamphetamine (crank) is a potent stimulant that can cause uncontrollable manic or paranoid behavior
  - Ice (crystal meth) is extremely addictive



after 3 years  
of crystal meth

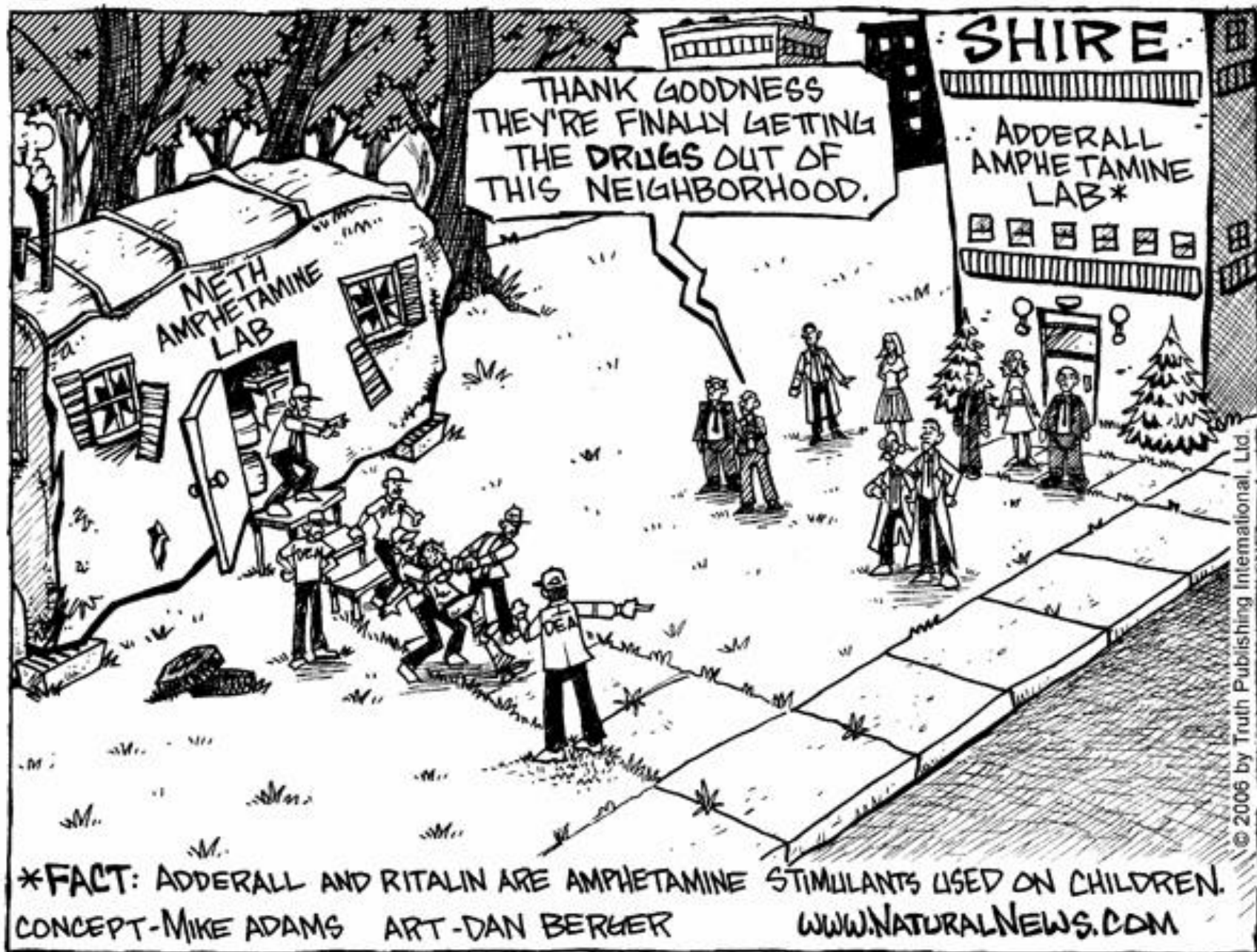


# Adderall

- ◆ Adderall is a prescription drug comprised of two different forms of amphetamine
- ◆ It is usually prescribed for ADHD as a substitute for the drug Ritalin
- ◆ Because it appears to increase alertness and concentration, some students use it as a “study drug”
- ◆ However, just as with other forms of amphetamine, it has a high potential for addiction



# COUNTERTHINK

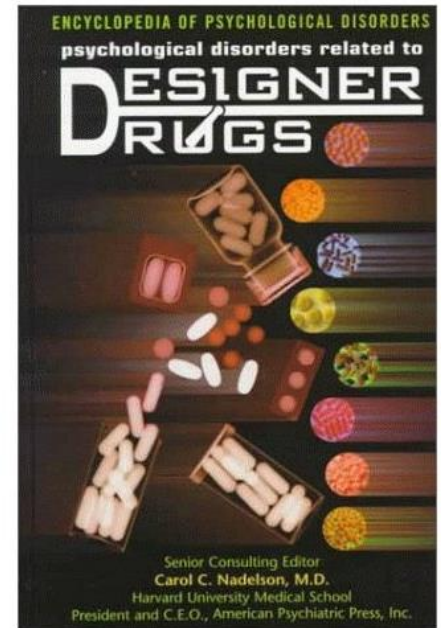


# Other Drugs of Concern

- ◆ Lysergic acid diethylamide (LSD) has become more popular in recent years
- ◆ Phencyclidine (PCP or angel dust) is often used as an additive to cocaine or marijuana
  - PCP produces unpredictable responses
- ◆ “Club Drugs” are a group of drugs most commonly used by teens and young adults who are at a bar, rave, or trance scene and include: Ecstasy, Rohypnol, GHB, and Ketamine

# Other Drugs of Concern

- ◆ Designer drugs, such as Ecstasy and China White, resemble FDA controlled substances but have a different chemical composition
- ◆ Designer drugs are often manufactured in home laboratories, which have poor quality control
- ◆ Over-the-counter (OTC) drugs are assumed to be safe, but have the potential for abuse and for lethal interactions with other drugs





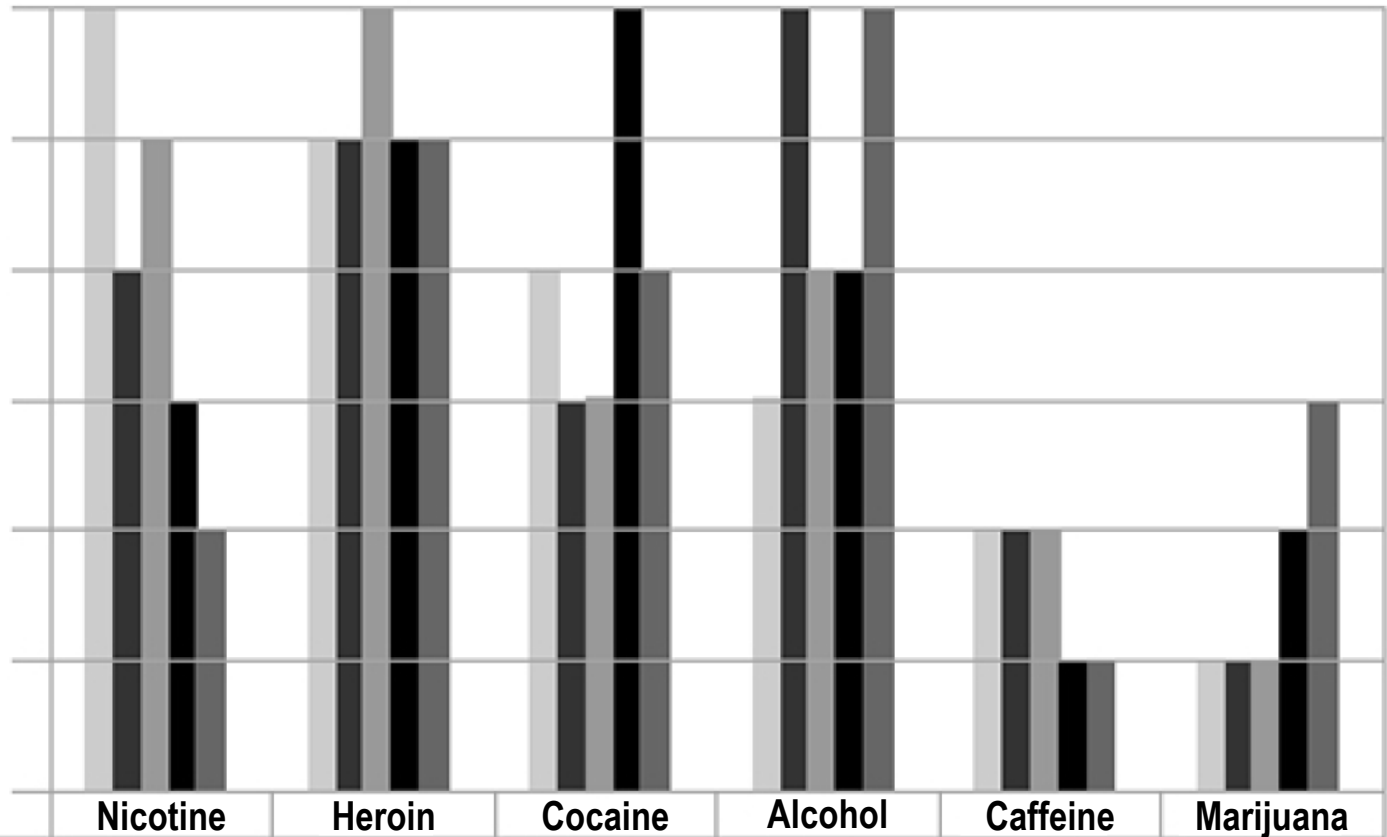
## Comparing Dangers of Popular Drugs

(Lower score indicates less serious effect)

**MORE  
SERIOUS**

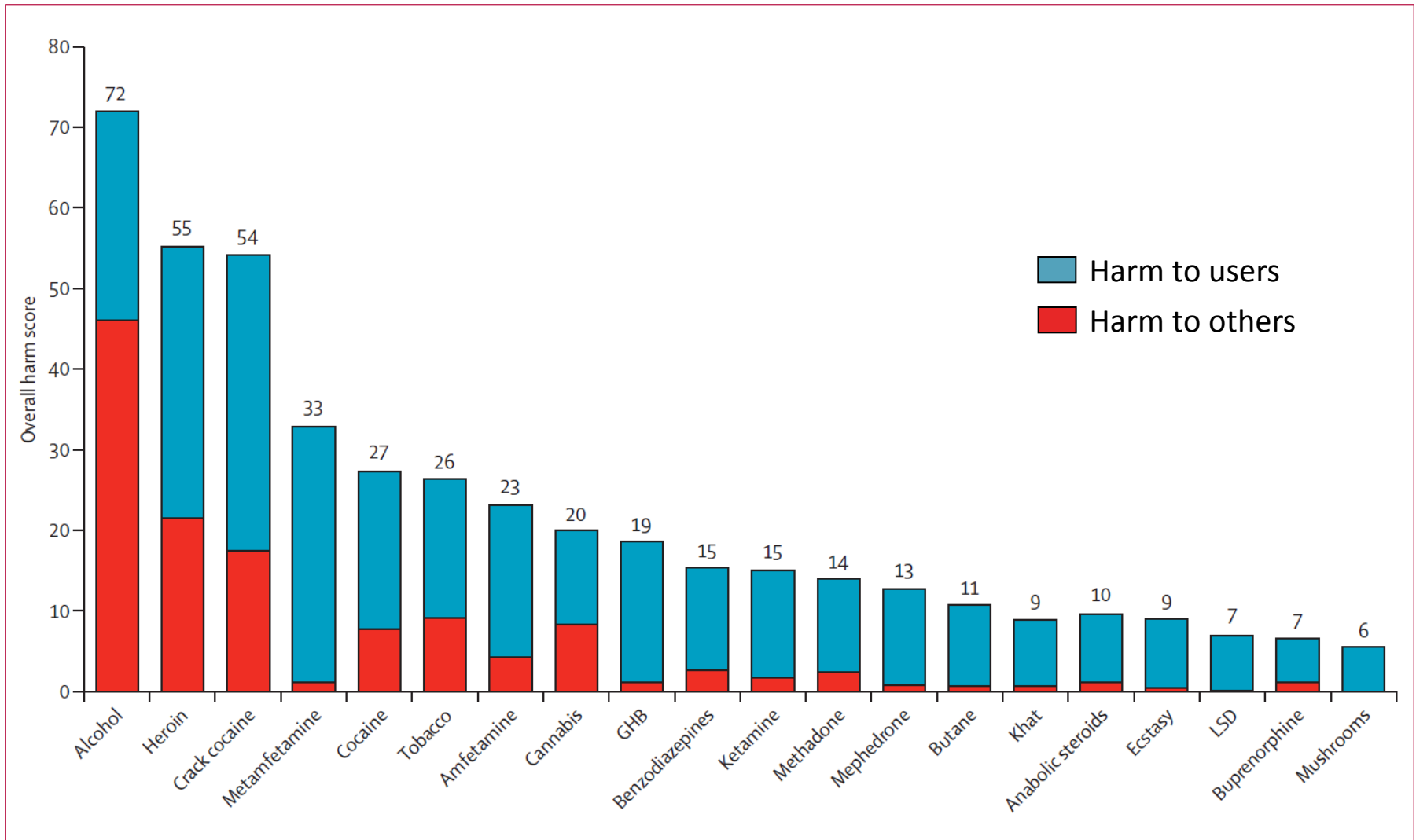


**LESS  
SERIOUS**



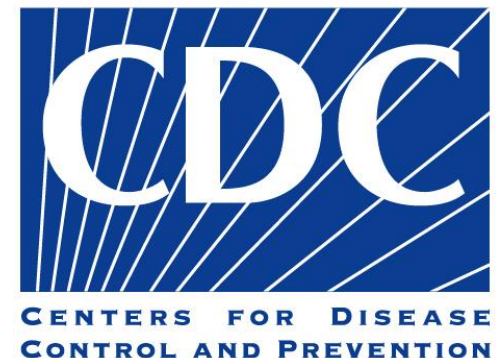
	Nicotine	Heroin	Cocaine	Alcohol	Caffeine	Marijuana
DEPENDENCE	6	5	4	3	2	1
WITHDRAWAL	4	5	3	6	2	1
TOLERANCE	5	6	3	4	2	1
REINFORCEMENT	3	5	6	4	1	2
INTOXICATION	2	5	4	6	1	3

# Drug Harms in the UK



# Leading Causes of Death

- ◆ According to the CDC, the four leading causes of death in 2004 were:
  - heart disease (654,092)
  - cancer (550,270)
  - stroke (150,147)
  - chronic lower respiratory diseases (123,884)



# Iatrogenic Causes of Death

- ◆ Iatrogenic = health conditions or problems that occur as a result of receiving medical treatment
- ◆ However, according to the Institute of Medicine, there are 225,000 deaths each year due to iatrogenic causes:

7,000 – medication errors in hospitals

106,000 – non-error, adverse effects of drugs

80,000 – nosocomial infections in hospitals

12,000 – unnecessary surgery

20,000 – other errors in hospitals



Is US Health Really the Best in the World?

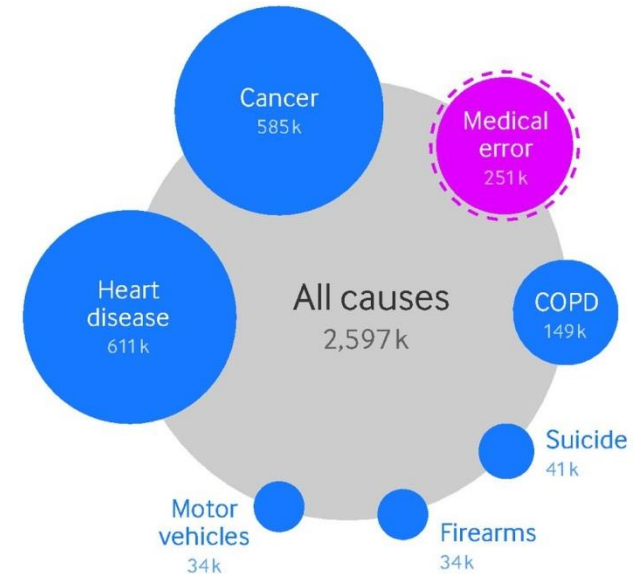
JAMA. 2000 Jul 26;284(4):483-5 <http://www.ncbi.nlm.nih.gov/pubmed/10904513>

# Drugs: The 4<sup>th</sup> Leading Cause of Death

- ◆  $7,000 + 106,000 = 113,000$ . When you add in the 17,000 deaths per year estimated to be from illicit use of drugs, this brings the total to 130,000, which makes drugs the 4th leading cause of death in the U.S.
- ◆ These numbers do not include the use of OTC medicines. For example, it is estimated that 15,000 people die each year due to bleeding ulcers caused by over-the-counter NSAID medication.
- ◆ But wait, there's more! These figures may be underestimating the true extent of the problem.

# 2016 Update

- ◆ Death certificates in the US, used to compile national statistics, have no facility for acknowledging medical error.
- ◆ The number of deaths translates to 9.5% of all deaths each year in the US, and puts medical error above the previous third-leading cause, respiratory disease.
- ◆ That doesn't even include doctors' offices and ambulatory care centers, that's only inpatient hospitalization resulting in errors.



# To Err is Human

- ◆ The Institute of Medicine estimate of 98,000 deaths per year from medical errors was based on 1984 data.
- ◆ A more recent 2013 estimate in the Journal of Patient Safety says:

*“The true number of premature deaths associated with preventable harm to patients was estimated at more than 400,000 per year.”*

*“Serious harm seems to be 10– to 20–fold more common than lethal harm.”*

# 2013 update on Hospital Deaths



*\*Annual premature deaths associated with preventable harm in hospitals.*

## CONCLUSIONS:

The epidemic of patient harm in hospitals must be taken more seriously if it is to be curtailed. Fully engaging patients and their advocates during hospital care, systematically seeking the patients' voice in identifying harms, transparent accountability for harm, and intentional correction of root causes of harm will be necessary to accomplish this goal.



*The true incidence of ADRs is much higher than generally recognized. Why is this the case? One reason is that hospitals have had strong incentives not to identify too many of these events. Reporting large numbers of adverse events and any serious preventable event brings intense scrutiny from regulators and the public. Thus, most hospitals have relied on spontaneous reporting, which only identifies about 1 in 20 adverse reactions and leads to the perception that injuries from ADRs are less common than they really are.*

# Adverse Drug Reactions

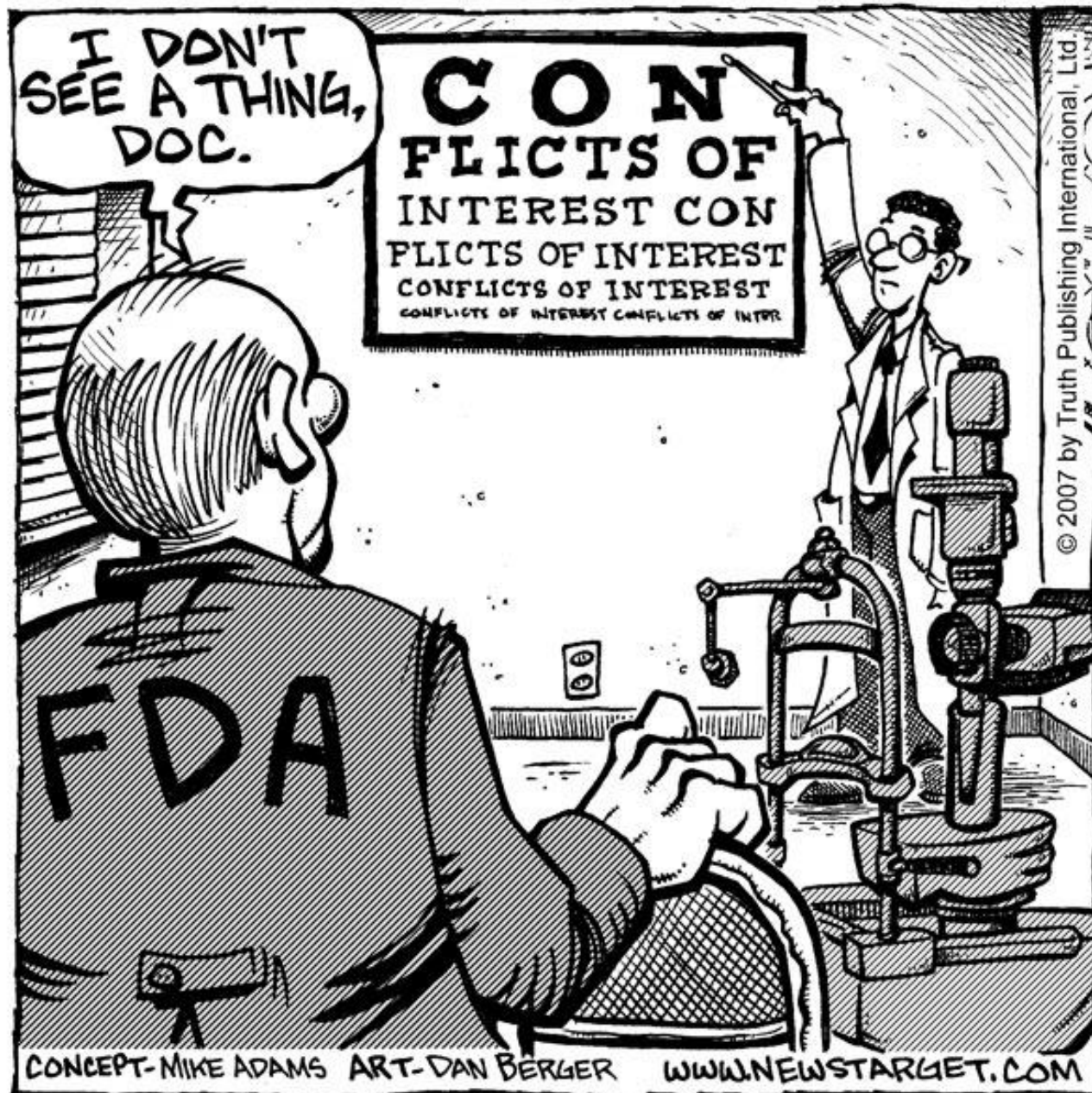
*“In 1993, Dr. David Kessler, former head of the U.S. Food and Drug Administration, stated that only about one percent of serious adverse drug events are reported.”*

*While the FDA has more than 1400 employees with principal duties related to approving new drugs, a full-time staff of only 52 monitors the safety of approximately 5000 brand name, generic, and over-the-counter drugs already in the marketplace.*

# Steven Nissen – Escape Fire



# COUNTERTHINK "FDA VISION TEST"



*Usually 2,000 to 3,000 patients are involved in testing for any given drug. Patients with complicated medical histories are often excluded from drug trials because efficacy is easier to establish this way.*  
*The third problem is lag. Adverse drug reactions occurring with long-term use cannot be detected. Many fatal effects are discovered after a medication is approved, during postmarketing surveillance.*  
*During this time, the medication is introduced to a larger number of patients who often have more concomitant illnesses than the original study group.*



The Drug Industry's Dirty Little Secret:  
Make as much money as you can,  
before you have to take it off the market.



# How is the pharmaceutical industry like the mafia?


*“It is scary how many similarities there are between this industry and the mob. The mob makes obscene amounts of money, as does this industry. The side effects of organized crime are killings and deaths, and the side effects are the same in this industry. The mob bribes politicians and others, and so does the drug industry ...”*







“A drug without side effects is no drug at all.”  
~ Eli Lilly~



# Natural Alternatives to Over-the-Counter and Prescription Drugs

Includes safe, natural alternatives to  
Tagamet • Prednisone • Seldane • Zantac •  
Cardizem, and 207 other prescription  
drugs, as well as natural alternatives  
to over-the-counter drugs used to treat  
acne • high cholesterol • heartburn •  
the common cold • insomnia • arthritis •  
headache • hay fever, and  
many other common ailments

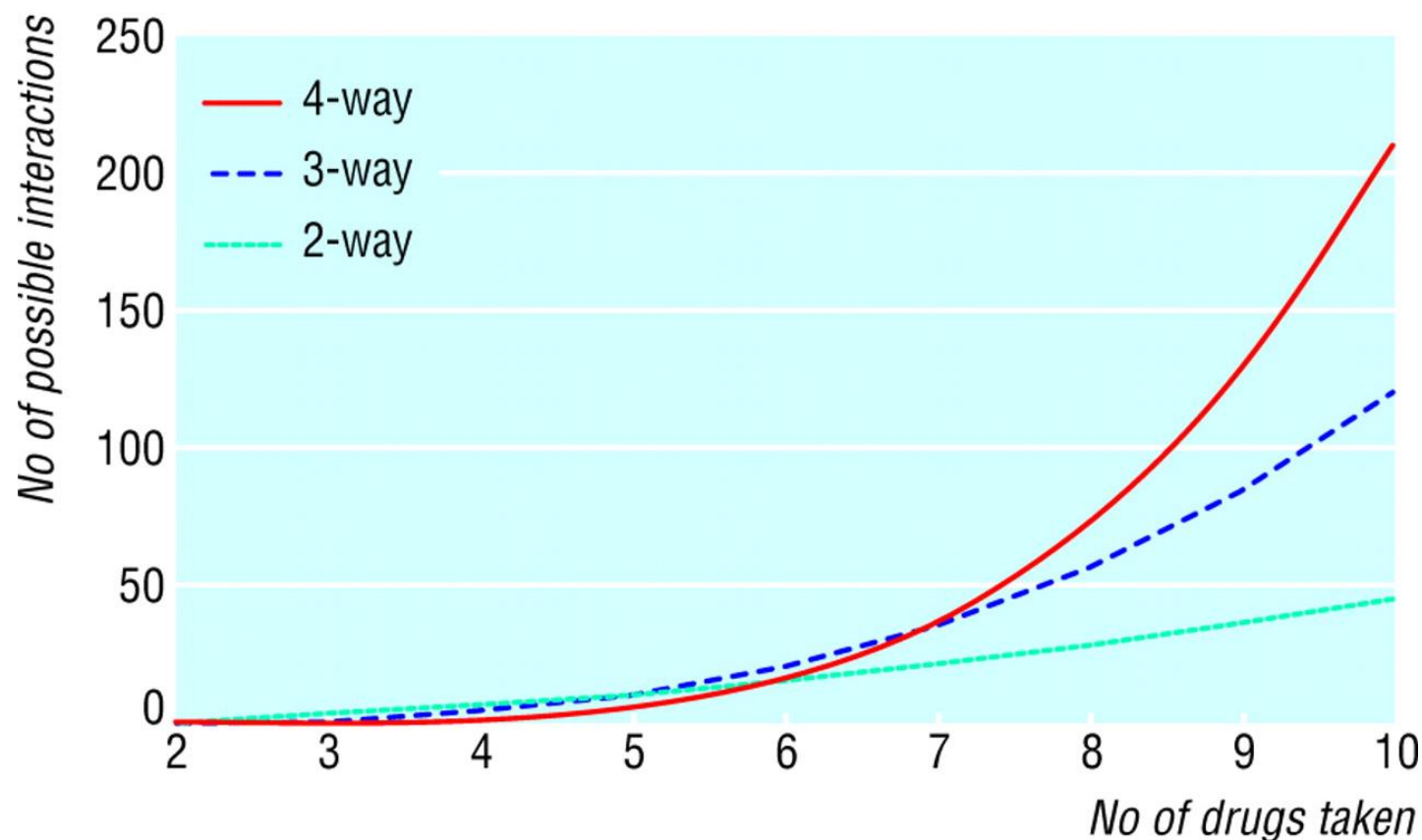
*Foreword by Alan R. Gaby, M.D.*

**Michael T. Murray, N.D.**

# Evaluating Patient Drug Use

- ◆ Getting your patients off these drugs may save their life. However, how you do this is important, so you will not get in trouble with your state board.
- ◆ When you take your patient's medical history, it is not uncommon to learn they are taking ten or more prescription drugs.
- ◆ In many cases there are nutritional alternatives that are not just as effective, they are more effective than the drugs.

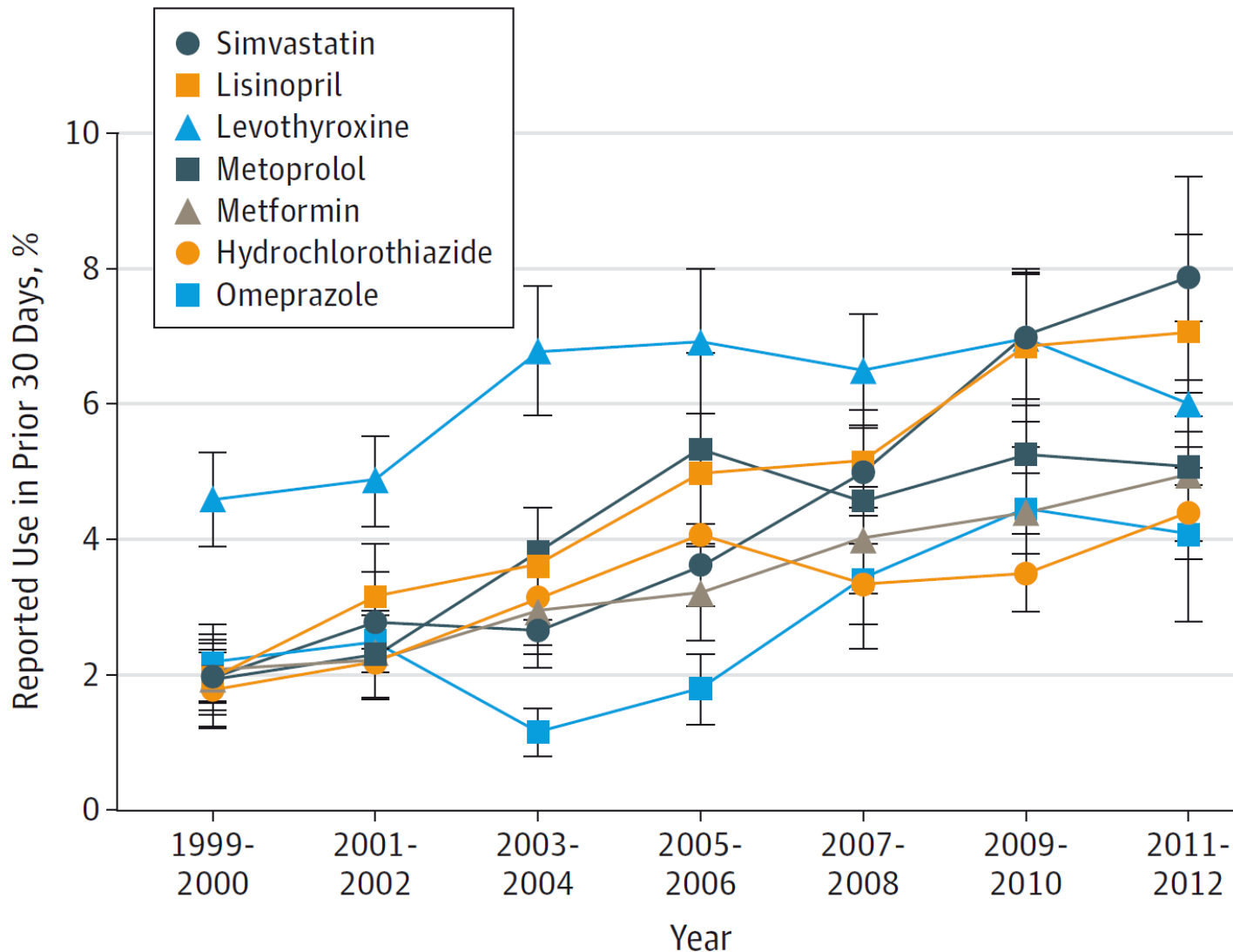
# Interactions From Taking Multiple Drugs



Polypharmacy = taking multiple drugs at the same time

Communicating information about drug safety

# Polypharmacy: 8.2% in 2000, 15% in 2012



# Evaluating Patient Drug Use

- ◆ As you start your patient on more natural alternatives to their drugs, they may be able to decrease or eliminate some of the drugs they are taking. However, this must be under the supervision of the prescribing physician.
- ◆ When your natural alternatives eliminate the **need** for the drug, the MD should be willing to adjust the patient's drug schedule.
- ◆ Contact the physician, to bring them up to date on the clinical improvement your patient has experienced with their nutritional and chiropractic program.

# Evaluating Patient Drug Use

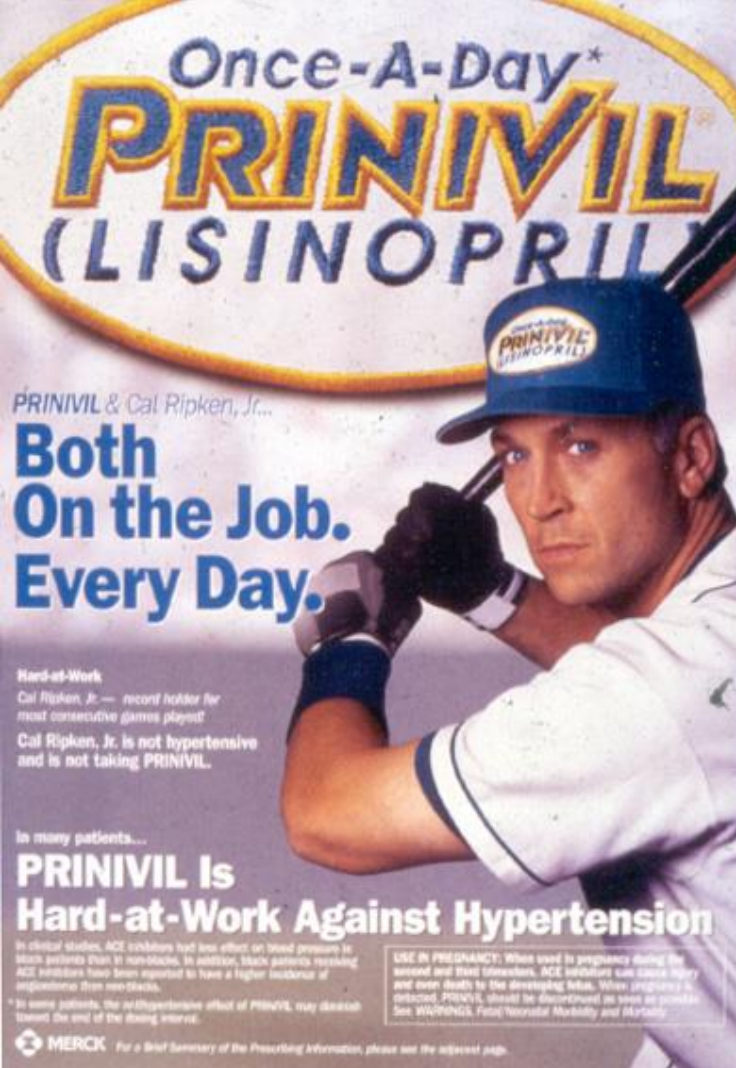
- ◆ Hopefully the physician will be open minded and cooperative. A lot depends upon the attitude you bring to this discussion.
- ◆ You and the medical physician share a common goal: Doing what is best for the patient. Medical physicians are acutely aware of and must deal with drug side effects every day.
- ◆ If you approach the MD with a spirit of cooperation to do what is best for the patient, you may find them receptive to modifying the patient's drug regimen.

# Evaluating Patient Drug Use

- ◆ However, if the physician is uncooperative, your patient may seek advice from another physician, or your patient may choose to exercise their free will to ignore the physician's advice.
- ◆ But you must always remember, even though the patient can do what they think is best for their health after considering all the information available to them, you cannot advise the patient to stop taking their drugs or reduce their dosage.



# Drug Ad Watch



Once-A-Day\*  
**PRINIVIL**  
(LISINOPRIL)

PRINIVIL & Cal Ripken, Jr...  
**Both  
On the Job.  
Every Day.**

**Hard-at-Work**  
Cal Ripken, Jr. — record holder for  
most consecutive games played\*  
Cal Ripken, Jr. is not hypertensive  
and is not taking PRINIVIL.

In many patients...  
**PRINIVIL Is  
Hard-at-Work Against Hypertension**

In clinical studies, ACE inhibitors had less effect on blood pressure in  
black patients than in non-blacks. In addition, black patients receiving  
ACE inhibitors have been reported to have a higher incidence of  
angiotensin from non-blacks.

\*In some patients, the antihypertensive effect of PRINIVIL may diminish  
toward the end of the dosing interval.

**USE IN PREGNANCY:** When used in pregnancy during the  
second and third trimesters, ACE inhibitors can cause injury  
and even death to the developing fetus. When pregnancy is  
suspected, PRINIVIL should be discontinued as soon as possible.  
See WARNINGS, Fetal/Neonatal Mortality and Morbidity.

**MERCK** For a Brief Summary of the Prescribing Information, please see the adjacent page.

# On the Job. Every Day.

## Hard-at-Work

Cal Ripken, Jr. — record holder for  
most consecutive games played

Cal Ripken, Jr. is not hypertensive  
and is not taking PRINIVIL.

In many patients....

**PRINIVIL Is**  
**Hard-at-Work Against Hyperten**



# Drug Ad Watch

The US is one of only two countries (the other is New Zealand) that allows direct to consumer television ads.

On the course web page under CAM web links you will find clickable links to TV drug ads. We will show some of these in class if time permits.



# Drug Ad Watch – Requip



<http://www.youtube.com/watch?v=pDvm-5Sochs&hd=1>



# Drug Ad Watch – Lipitor



<http://www.youtube.com/watch?v=QALoe5tQ4ml&hd=1>

# Cost of drugs advertised on TV

